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EPA Official Backs Increased Monitoring, Mitigation For Vapor Intrusion
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An EPA official leading the agency's effort to create guidance for assessing vapor intrusion risk from chlorinated solvents is calling for long-term monitoring of contaminated sites to account for the unpredictable movement of toxic vapors to indoor air and is suggesting that preemptive mitigation be used at buildings with suspected vapor intrusion risk.

Richard Kapuscinski of EPA's Office of Superfund Remediation & Technology Innovation (OSRTI) made the comments Sept. 6 during the Environmental Law Institute's webinar "Vapor Intrusion: The State of the Science and the Law," which provided a broad overview of the upcoming vapor intrusion guidance. While EPA said as recently as last month that it intended to finalize the vapor intrusion guidance by Nov. 30, Kapuscinski during the webinar would not commit to a specific release date.

Kapuscinski said the final document will advise risk assessors to consider multiple lines of evidence including the strength and location of a source as well as geological and weather factors that could contribute to the movement of vapors into a building. Since risk assessors already work in this way, Kapuscinski said, the new guidance would not change the way regulators work too much.

"When the final guidance is issued it is not likely to have a significant impact on sites currently undergoing vapor intrusion investigation because the current draft largely reflects current practice," Kapuscinski said, adding that one notable difference is that the draft includes a presumption for EPA to sample whenever there is evidence of a release, which is different from current practice because industry standards do not require sampling.

Still, he called vapor intrusion a significant issue and said there are a few hundred sites subject to Superfund and Resource Conservation & Recovery Act corrective action that have subsurface contamination and vapor intrusion risk. Other experts have said the guidance will also affect work in many states that do not have their own vapor intrusion policy, because state regulators will use the EPA document to write their own procedures.

EPA has been working on guidance to address vapor intrusion, which occurs when toxic vapors rise from underground contamination into buildings through dirt floors, cracked foundations or other pathways, for many years, first releasing a draft guidance in 2002. Public comments on that draft and on technical documents used for creating more recent version have been submitted to EPA, Kapuscinski said, and a new draft of the guidance will not be released in advance of the release of the final guidance.

To support his call for long-term monitoring, Kapuscinski cited the high degree of variability of trichloroethylene (TCE) samples taken over time and at different locations at the same site. TCE

sampling data from Lowry Air Force Base in Colorado show that samples taken at six different times yielded some results that were 40 times higher than others, even when taken within the same building. A short coming of the data, Kapuscinski said, is that EPA does not have samples taken over multiple years, which would help put the information in a better long-term context.

He attributed variability to non-uniform distribution of the source, as well as variations in soil, weather, and the operation of heating and air conditioning systems within buildings.

"A single indoor air or subsurface sample has limited value by itself," Kapuscinski states in a slide presentation he gave during the webinar. "A time averaged sample over a couple of days will not be sufficient to support a conclusion of no further action," he said. The document is available on InsideEPA.com. (Doc ID: 2409438)

Since properly assessing vapor intrusion risk takes time, Kapuscinski said, preemptive mitigation is an appealing and affordable option for protecting human health at buildings with suspected vapor intrusion risk. Mitigation methods for vapor intrusion are similar to those used to protect against radon risk, he said.

In addition to finalizing separate guidances for vapor intrusion from chlorinated solvents and petroleum hydrocarbons associated with leaking underground storage tanks, EPA has announced it intends to add vapor intrusion as a sole reason for adding a hazardous waste site to its Superfund National Priorities List. Kapuscinski said during the webinar that no public action on that project is expected this year.

EPA is also considering standards for short-term exposure to toxic vapors from TCE, with a headquarters-level review of a proposed interim Removal Action Level (RAL) to protect workers near a Superfund site in Mountain View, CA, from the risk of cardiac birth defects.

Kapuscinski's support of long-term monitoring, or using multiple short-term samples over an extended period, rather than taking fewer longer-term samples, lends credence to comments the Center for Public Environmental Oversight (CPEO), based in Mountain View, CA, submitted to EPA earlier this year, requesting that EPA include stricter monitoring requirements in the upcoming guidance.

But it is unclear from Kapuscinski's comments whether EPA plans to include recommendations for increased monitoring in the final guidance. "I have talked to other people at EPA that are very sympathetic to my position" pushing for near-continuous monitoring, CPEO Director Lenny Siegel said after the webinar. But, he added, "This is a process that involves a lot of people and pressure from a lot of different directions."

CPEO's written June comments were a response to short-term exposure concerns, namely the risk of cardiac birth defects, raised by the EPA's Integrated Risk Information System (IRIS) assessment for TCE released in September 2011, and EPA Region IX's subsequent proposed interim RAL of 15 micrograms

per cubic meter (ug/m^3) in indoor air, which is aimed at protecting workers near the Middlefield-Ellis-Whisman Superfund site in Mountain View from cardiac birth defects.

While Kapuscinski did not address short-term exposures during the webinar, Siegel, who was also a panelist, said the issues raised by short-term exposure to TCE will have to be addressed. He reiterated his calls for continuous or near continuous monitoring saying sampling over long periods is necessary to detect spikes in indoor air contamination, especially since the recent IRIS assessment for TCE suggested risk of cardiac birth defects could exist at low levels and over exposure periods as short as three weeks, and possibly as little as one day.

"There is a need to adjust sampling strategies for TCE to detect for peak exposures and to protect the most vulnerable," he said.

Also, with stricter monitoring, Siegel said, builders would have more data to know when they should install ventilation fans, whereas with fewer results the need may not be apparent.

Siegel described new sampling technologies, including some sensors as small as an iPod, that if connected to the internet could be monitored continuously either by a person watching a computer monitor or by the computer itself. While the technologies currently exist on a bench scale, Siegel said, including stricter monitoring requirements in guidance would prompt companies to innovate more affordable versions.

"We need some direction from EPA and states saying, 'this is how we want to sample in the future,'" Siegel said.

Siegel and panelist Christopher Roe, a partner with Fox Rothschild, LLP, in Exton, PA, who advises clients on real estate deals and brownfield redevelopments, both said more education is necessary so residents, occupants of commercial buildings and in some cases, regulators, understand the risks associated with detected levels of indoor air contamination.

Roe called the comparison levels that risk assessors now face "unprecedented," adding that the levels suggested to protect against cancer risk from TCE are below background levels commonly found in indoor air, which can come from products such as gun cleaner. "The source can be vapor intrusion, or the source can be a source within the building itself," Roe said, adding that such strict levels create uncertainty for property owners but that the EPA guidance will help.

Another problem that has arisen with increased awareness of vapor intrusion risk in recent years is that some responsible parties who think risk has been mitigated later find out additional sampling is required. Additional liability concerns exist not only for cleanup, which is fairly easy to estimate, but also from claims accusing property owners or responsible parties of hiding information about contamination -- allegations, which Roe said are often skewed by plaintiffs because the responsibility party conducted a risk assessment years earlier, at at time when vapor intrusion off-site was not considered